

(19)



Europäisches Patentamt
European Patent Office
Office européen des brevets



(11)

EP 1 103 627 A3

(12)

EUROPEAN PATENT APPLICATION

(88) Date of publication A3:
18.12.2002 Bulletin 2002/51

(51) Int Cl. 7: C23C 4/12, C23C 4/18,
C23C 4/02

(43) Date of publication A2:
30.05.2001 Bulletin 2001/22

(21) Application number: 00310229.0

(22) Date of filing: 17.11.2000

(84) Designated Contracting States:
AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU
MC NL PT SE TR

Designated Extension States:
AL LT LV MK RO SI

(30) Priority: 24.11.1999 US 448595

(71) Applicant: GENERAL ELECTRIC COMPANY
Schenectady, NY 12345 (US)

(72) Inventors:

- Farmer, Gilbert
Cincinnati, Ohio 45239 (US)
- Scheidt, Wilbur Douglas
Cincinnati, Ohio 45233 (US)

- Fehrenbach, Jeffrey Arnold
Cincinnati, Ohio 45255 (US)
- Tomlinson, Thomas John
West Chester, Ohio 45069 (US)
- Heidorn, Raymond William
Fairfield, Ohio 45014 (US)
- Crow, John Maynard
Morrow, Ohio 45152 (US)

(74) Representative: Pedder, James Cuthbert et al
GE London Patent Operation,
Essex House,
12/13 Essex Street
London WC2R 3AA (GB)

(54) Method for thermal barrier coating

(57) A method of applying thermal barrier coating systems to a metal piece (10) having a cooling hole extending along a central axis (52) through the piece from a first surface (22) of the piece (10) to a second surface (42) of the piece (10) opposite the first surface (22). The method includes spraying a bond coat (60) on the first surface (22) of the piece (10) and spraying a thermal

barrier coating (70) on the bond coat (60). Further, the method includes spraying a high pressure fluid jet from a nozzle (46) toward the hole and in a direction generally parallel to the central axis (52) of the hole. The fluid jet is substantially free of solid particulate thereby permitting the jet to remove the bond coat (60) and the thermal barrier coating (70) from the hole without removing metal from the piece (10).

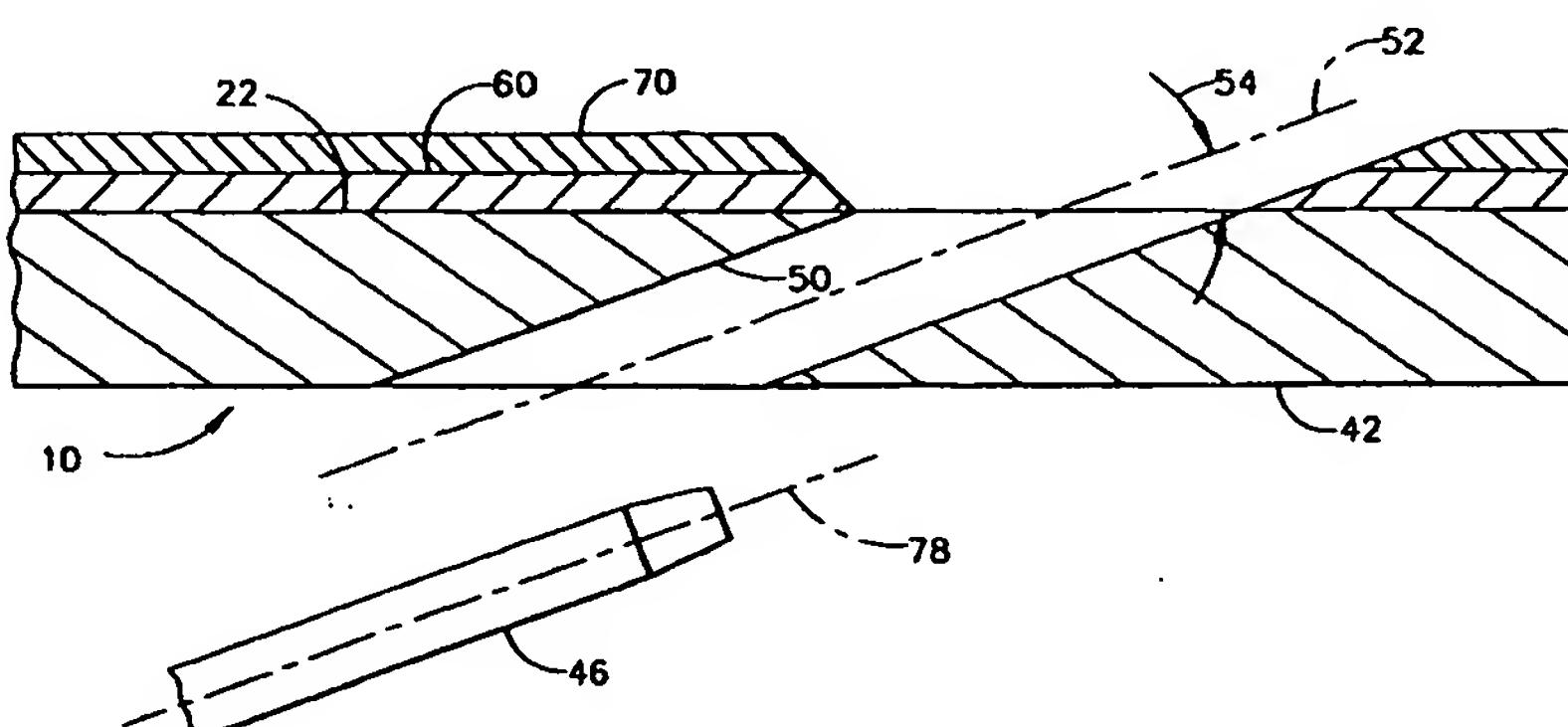


FIG. 6



| DOCUMENTS CONSIDERED TO BE RELEVANT | | | | | | | | | |
|--|---|-------------------|---|-----------------|----------------------------------|----------|--------|-----------------|---------------|
| Category | Citation of document with indication, where appropriate, of relevant passages | Relevant to claim | CLASSIFICATION OF THE APPLICATION (Int.Cl.7) | | | | | | |
| X | EP 0 916 445 A (ROLLS ROYCE PLC) 19 May 1999 (1999-05-19) * the whole document * --- | 1-6 | C23C4/12 C23C4/18 C23C4/02 | | | | | | |
| X | WO 99 23273 A (BEELE WOLFRAM ;SIEMENS AG (DE)) 14 May 1999 (1999-05-14) * page 1, line 27 - page 2, line 21 * * page 4, line 34 - page 5, line 26 * * page 8, line 17 - page 9, line 7 * --- | 1-6 | | | | | | | |
| X | US 4 338 360 A (CAVANAGH JOHN R ET AL) 6 July 1982 (1982-07-06) * column 1, line 40 - column 2, line 36 * * column 4, line 25 - column 5, line 46 * --- | 1-6 | | | | | | | |
| X | PATENT ABSTRACTS OF JAPAN vol. 1997, no. 10, 31 October 1997 (1997-10-31) & JP 09 158702 A (ISHIKAWAJIMA HARIMA HEAVY IND CO LTD;EBARA CORP), 17 June 1997 (1997-06-17) * abstract * --- | 1-6 | | | | | | | |
| A | PATENT ABSTRACTS OF JAPAN vol. 1996, no. 08, 30 August 1996 (1996-08-30) & JP 08 108400 A (ISHIKAWAJIMA HARIMA HEAVY IND CO LTD;EBARA CORP), 30 April 1996 (1996-04-30) * abstract * ----- | 1 | C23C TECHNICAL FIELDS SEARCHED (Int.Cl.7) | | | | | | |
| <p>The present search report has been drawn up for all claims</p> <table border="1"> <tr> <td>Place of search</td> <td>Date of completion of the search</td> <td>Examiner</td> </tr> <tr> <td>MUNICH</td> <td>28 October 2002</td> <td>Joffreau, P-O</td> </tr> </table> <p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document</p> | | | | Place of search | Date of completion of the search | Examiner | MUNICH | 28 October 2002 | Joffreau, P-O |
| Place of search | Date of completion of the search | Examiner | | | | | | | |
| MUNICH | 28 October 2002 | Joffreau, P-O | | | | | | | |

ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.

EP 00 31 0229

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

28-10-2002

| Patent document cited in search report | | Publication date | | Patent family member(s) | | Publication date |
|---|---|---------------------|----|----------------------------|------------|---------------------|
| EP 0916445 | A | 19-05-1999 | EP | 0916445 A2 | 19-05-1999 | |
| | | | US | 6004620 A | 21-12-1999 | |
| WO 9923273 | A | 14-05-1999 | WO | 9923273 A1 | 14-05-1999 | |
| | | | DE | 59801545 D1 | 25-10-2001 | |
| | | | EP | 1029103 A1 | 23-08-2000 | |
| | | | JP | 2001521989 T | 13-11-2001 | |
| | | | US | 6365013 B1 | 02-04-2002 | |
| US 4338360 | A | 06-07-1982 | CA | 1149241 A1 | 05-07-1983 | |
| JP 09158702 | A | 17-06-1997 | | NONE | | |
| JP 08108400 | A | 30-04-1996 | | NONE | | |